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10/598,701	07/19/2007	Antonio D'Errico	4015-5835	9122

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EXAMINER	
NGO, TANYA T	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,701	D'ERRICO ET AL.	
	Examiner	**Art Unit**	
	TANYA NGO	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-36_ is/are pending in the application.

4a) Of the above claim(s) _1-18_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _19-27,29 and 32-36_ is/are rejected.

7)☒ Claim(s) _28,30 and 31_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _9/8/2006_.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 19 and 32 are rejected under 35 U.S.C. 102(a) as being anticipated by Stalford et al (herein Stalford) WO 2004/023693.

Re claim 19, Stalford discloses an optical modulation converter configured to convert the modulation format of an optical input signal, the optical modulation converter comprising:

a birefringent medium *(optical delay interferometer 24 may be a birefringent fiber follow by a polarizer, pg 7, lines 21-23)* having first and second main axes of symmetry *(the birefringent fiber includes two transmission axes, pg 7, lines 29-30)*, and a selected differential group delay between the first and second main axes of symmetry *(the two transmission aces includes a 'fast' axis and a 'slow' axis, pg 7, lines 29-31)*, the birefringent medium configured to separate an optical input signal passed through the first and second main axes into two optical components such that each optical component travels along different ones of the first and second main axes at a different group velocity *(the delay interferometer delays a first portion of the an optical signal with respect to a second portion of the optical signal pg. 7, lines 21-*

25, wherein the difference in the transmission speeds between the fast and slow aces operate to introduce the delay, Pg 7, lines 29-33).

Re claim 32, Stalford discloses a method of converting a modulation format of an optical input signal, the method comprising:

inputting an optical input signal into a birefringent medium having first and second main axes of symmetry and a selected differential group delay between the first and second main axes *(optical delay interferometer 24, Fig. 1 may be a birefringent fiber followed by a polarizer to delay a first portion of an optical signal with a second portion of the optical signal, pg. 7, lines 21-25, wherein in order for an optical signal to be present it must be inputted. Furthermore, in the birefringent fiber embodiment, the fiber includes two transmission aces, a "fast" axis and a "slow" axis which introduce the delay between the signals, Pg. 7, line 26-33)*; and

separating the optical input signal into two optical components such that each optical component travels along different ones of the first and second main axes at a different group velocity *(the birefringent fiber embodiment, the fiber includes two transmission axes, a "fast" axis and a "slow" axis which introduce the delay between the signals, Pg. 7, line 26-33 wherein the delay of the first portion of the optical signal with respected to the second portion of the optical signal, pg. 7, lines 21-25. Thus, the optical signal is split into a first and second portion of the signal with a delay difference between them, wherein the delay is implemented via the transmission axes. Also, the delay results in different group velocities between the axes).*

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 20 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford et al (herein Stalford) WO 2004/023693.

Re claim 20 and 35, Stalford discloses all the elements of claim 19 and 32, which claim 20 and 35 are dependent upon. Stalford did not explicitly discloses wherein the birefringent medium is selected based on a bit rate of the optical input signal such that the differential group delay introduced by the birefringent medium is substantially equal to a bit period of the optical input signal. However, Stalford does teach that the delay imposed by the optical delay interferometer determines the pulse width (and therefore the duty cycle) of the OTDM signal, pg 11, lines 2-5, and the OTDM optical signal may have a one hundred percent duty ratio, which corresponds to an NRZ signal, pg 3, lines 14-16. Since the duty ratio or duty cycle is defined as the ratio of the pulse duration to the pulse period by the Newnes Dictionary of Electronics, and percent duty ratio means the pulse duration is equivalent to the pulse period. It would be obvious for one of ordinary skill in the art to understand that the pulse width or duration of the bit is equal to the pulse period or bit period.

Furthermore, since the pulse width is determined by the delay introduce by the optical delay interferometer pg. 11, lines 2-5, which includes the birefringent fiber which

introduces a delay between two signals pg 7, lines 21-25. It would be obvious for one of ordinary skill in the art as a matter of design choice to select a birefringent medium, which introduces the differential group delay, that would result in the circumstances previously presented, which are that the pulse width is equal to the bit period, because the pulse width is dependent upon the differently group delay introduced by the birefringent fiber, to output an NRZ signal.

3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 19 above, and further in view of Suzuki et al (herein Suzuki) US Patent 6,459,518.

Re claim 21, Stalford discloses all the element of claim 19, which claim 21 is dependent upon. Stalford does not appear to explicitly disclose a polarization controller configured to cancel random polarization fluctuations in the optical input signal before it is received by the birefringent medium. However, Suzuki discloses output light from the phase shifter or modulator 220, Fig 7 enters a birefringent medium 232 through a polarization controller 230, Fig 7, Col 9, lines 40-42, wherein the polarization controller 230 can be used to adjust the polarization direction of the signal light power is equalized at each polarization axis taking account of the polarization dependent loss of the birefringent medium 232 and to modify or adjust the power allocation of each polarization axis of the birefringent medium, Col 9, lines 47-53. Stalford and Suzuki are analogous art because they are from the same field of endeavor, birefringent mediums. At the time of the invention, it would have been obvious

to one of ordinary skill in the art, having the teachings of Stalford and Suzuki before him or her, to modify the optical delay interferometer of Stalford to include the polarization controller prior to the birefringent medium of Suzuki because it equalizes the signal light power at each polarization axis, Col 9, lines 45-53, resulting the canceling of random polarization fluctuations because the power is equalized.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 19 above, and further in view of Fuji et al (herein Fuji) US Patent 4,603,941.

Re claim 22, Stalford discloses all the elements of claim 19, which claim 22 is dependent upon. Stalford discloses the optical delay interferometer 24 comprises of a birefringent fiber. Stalford does not appear to explicitly disclose herein the birefringent medium comprises a polarization maintaining fiber. However, Fuji discloses that is well known in the art that such a polarization maintaining fiber is called a birefringent fiber because it has birefringence induced by the internal stress or isotropic structure, Col 1, lines 11-19. Stalford and Fuji are analogous art because they are from the same field of endeavor, birefringent fibers. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Stalford and Fuji before him or her, to understand that the birefringent medium of Stalford which is a birefringent fiber is a polarization maintaining fiber of Fuji because it is well known in the are that birefringent fibers and polarization maintaining fibers.

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 19 above, and further in view of Watanabe et al (herein Watanabe) US Patent 6,049,425.

Re claim 23, Stalford discloses all the elements of claim 19, which claim 23 is dependent upon. Stalford does not appear to explicitly disclose an optical isolator operatively coupled to an input of the birefringent medium. However, Watanabe discloses the polarization-independent type optical isolator separates and couples light rays by the action of a birefringent crystal so that it permits the transmission of only the light rays progressing along the direction of transmission, while keeping the reflected light rays which progress in the direction opposite to the light-transmitting direction away from the optical path to thus prevent the reflection back thereof to the semiconductor laser, Col 1, lines 39-46. Stalford and Watanabe are analogous art because they are from the same field of endeavor, the use of birefringent mediums. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Stalford and Watanabe before him or her, to modify the birefringent medium of Stalford, which is a birefringent fiber to include the optical isolator of Watanabe because it permits the transmission of only the light rays progressing along the direction of transmission, while keeping the reflected light rays which progress in the direction opposite to the light-transmitting direction away from the optical path to thus prevent the reflection back thereof to the semiconductor laser, Col 1, lines 39-46.

6. Claim 24, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 19 above, and further in view of Cimini et al (herein Cimini) US Patent 5,008,958.

Re claim 24, Stalford discloses all the elements of claim 19, which claim 24 is dependent upon. Furthermore, Stalford discloses wherein the optical input signal to be converted comprises a phase-modulated optical signal *(the output of multi-electrode phase modulator, a differential phase shift keying signal, is transmitted to the optical delay interferometer, pg 8, lines 24-26, wherein the output of the phase modulator is the input signal of the delay interferometer, Fig. 1, and a DPSK signal is a phase modulated signal)*, and wherein the birefringent medium is selected such that the selected differential group delay between the first and second main axes of symmetry *(the two transmission aces, a "fast" axis and "slow" axes, wherein the difference in transmission speeds between the fast and slow aces operate to introduce a delay)* results in the birefringent medium outputting a corresponding polarization-modulated signal *(the polarization-modulated signal is a result of said birefringent medium. Since Stalford disclose such a birefringent medium with an input of a phase modulated optical signal and a differential group delay between the first and second main aces of symmetry, the results would be the same and a polarization modulated signal would be present)*. However, Cimini discloses a local oscillator linear polarized and launched at 45 degrees to the principal aces of the birefringent fibers, Fig. 17 outputs two polarizations P_O and P_1, Fig 7, from a signal with an initial polarization of 45 degrees, Fig. 7. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion using birefringent fibers.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that the birefringent fiber outputs a polarization-modulate signal.

To the extent that Stalford does not disclose the differential group delay of the birefringent medium such that a signal output by the birefringent medium comprises a corresponding polarization modulated signal. Cimini discloses a frequency shift key to amplitude shift keyed signal converter in Fig. 7 wherein a birefringent fiber B, Fig. 17 outputs two polarizations P_0 and P_1, Fig 7, from a signal with an initial polarization of 45 degrees, Fig. 7. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that the birefringent fiber outputs a polarization-modulate signal.

Re claim 26, Stalford and Cimini disclose all the elements of claim 24, which claim 26 is dependent upon. Stalford discloses wherein the birefringent medium comprises at least a part of a first conversion stage of the optical modulation converter, and further comprising a second conversion stage operatively connected to the output of the birefringent medium *(optical delay interferometer 24 may be a birefringent fiber followed by a polarizer, pg. 7, line 21-24, wherein the polarizer is the second conversion stage)*, the second conversion stage including a polarization-sensitive device configured to convert the polarization-modulated signal into a corresponding intensity-modulated signal *(the optical delay interferometer, which includes the birefringent fiber and the polarizer, pg 7, line 21-23 wherein the polarizer may be employed to align*

the polarization of the light output from the birefringent fiber, pg 8, lines 1-3. The signal that is passed through optical delay interferometer 24 is converted to an RZ signal, pg 8, lines 27-29. Since the polarizer follows the birefringent fiber in the optical delay interferometer, the output signal of the polarizer is an RZ signal, which is an intensity modulated signal and the polarized is a polarization sensitive device that is applied to the output of the birefringent fiber, which would output a polarization modulated signal).

To the extent that Stalford does not disclose a polarization-sensitive device configured to convert the polarization-modulated signal into a corresponding intensity-modulated signal, Cimini discloses a frequency shift key to amplitude shift keyed signal converter in Fig. 7 wherein a birefringent fiber B, Fig. 17 outputs two polarizations P_0 and P_1, Fig 7. The output light of the birefringent fiber is then pass through a polarizer aligned with either P_0 or P_1, which blocks one polarization, in this case P_1, so that the output of the polarizer is an on-off signal or a intensity modulated signal, Fig 7, lines 57-65. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that polarizer make the polarization modulated signal into amplitude or intensity modulated signal by removing the other polarization from the birefringent fiber.

Re claim 27, Stalford and Cimini disclose all the elements disclose all the elements of claim 26, which claim 27 is dependent upon. Furthermore, Stalford discloses wherein the polarization-sensitive device comprises one of a polarizer or a polarization splitter *(optical*

delay interferometer 24 may be a birefringent fiber followed by a polarizer, pg. 7, line 21-24, wherein the polarizer is the second conversion stage).

7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 19 above, and further in view of Ashkin et al (herein Ashkin) US Patent 4,529,262.

Re claim 25, Stalford discloses all the elements of claim 19, which claim 25 is dependent upon. Furthermore, Stalford discloses wherein the optical input signal comprises a phase modulate optical input signal *(the output of the multi-electrode phase modulator 22, a differential phase shift keying signal, is transmitted to the optical delay interferometer, pg 8, lines 24-227 wherein an DPSK signal is a phase modulated optical signal)*. Stalford does not discloses wherein the optical input signal is coupled at 45° to the first and second main axes of the birefringent medium when the optical input signal comprises having a linear polarization. However, Ashkin discloses a birefringent fiber section 12 is fed at the input with laser light linearly polarized at 45 degrees to the principal axes A1 and B1, illustrated in Fig. 2, thus equally exciting the two orthogonal modes, Col 3, lines 29-34. Stalford and Ashkin are analogous art because they are from the same field of endeavor, inputting signals into birefringent fibers. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Stalford and Ashkin before him or her, to modify the input of the birefringent fiber of Stalford to include the inputting signals is

linearly polarized and input at a 45 degree angle from the two main axes of Ashkin because it will equally excite the two orthogonal modes.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford and Cimini as applied to claim 26 above, and further in view of Han et al (herein Han) US PG PUB 2003/0090673.

Re claim 29, Stalford and Cimini disclose all the elements of claim 26, which claim 29 is dependent upon. Stalford or Cimini do not explicitly discloses a photodetector disposed at an output of the second conversion stage configured to detect the corresponding intensity-modulated signal. Han discloses a polarization mach-zehnder interferometer 100 which comprises a birefringent crystal 105 to polarize the light beam, if the light beam being inputted is unpolarizaed, ¶ [0018], a polarizer 112 set to polarize the light beam 114 output from the birefringent crystal 106, and a detector that 116 that detects the light passed through the polarizer, ¶ [0020]. Stalford and Han are analogous art because they are from the same field of endeavor, birefringent interferometers. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Han and Stalford before him or her, to modify the optical delay interferometer of Stalford to include the photodetector after the polarizer of Han because it allows one to detect the light passed through the polarizer, ¶ [0020]. Naturally flowing from the combination of Stalford and Han, the detector would detect the intensity-modulated signal.

9. Claim 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford as applied to claim 32 above, and further in view of Cimini et al (herein Cimini) US Patent 5,008,958.

Re claim 33, Stalford discloses all the elements of claim 32, which claim 33 is dependent upon. Furthermore, Stalford discloses wherein the optical input signal to be converted comprises a phase-modulated optical signal *(the output of multi-electrode phase modulator, a differential phase shift keying signal, is transmitted to the optical delay interferometer, pg 8, lines 24-26, wherein the output of the phase modulator is the input signal of the delay interferometer, Fig. 1, and a DPSK signal is a phase modulated signal)*, and wherein the method further comprises selecting the differential group delay of the birefringent medium such that a signal output by the birefringent medium comprises a corresponding polarization modulated signal *(the birefringent fiber embodiment includes two transmission axes with different transmission speeds to introduce a delay, pg 7, lines 29-33 wherein the delay is imparted to the first portion of an optical signal with respect to a second portion of the optical signal pg 7, lines 22-25, and the two transmission axes of the birefringent fiber will result in the output of a polarization modulated signal)*.

To the extent that Stalford does not disclose the differential group delay of the birefringent medium such that a signal output by the birefringent medium comprises a corresponding polarization modulated signal. Cimini discloses a frequency shift key to amplitude shift keyed signal converter in Fig. 7 wherein a birefringent fiber B, Fig. 17 outputs two polarizations P_O and P_1, Fig 7, from a signal with an initial polarization of 45

degrees, Fig. 7. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that the birefringent fiber outputs a polarization-modulate signal.

Re claim 34, Stalford and Cimini disclose all the elements of claim 33, which claim 34 is dependent upon. Stalford further comprising converting the polarization-modulated signal into an intensity-modulated signal by applying the polarization-modulated signal to a polarization-sensitive device *(the optical delay interferometer, which includes the birefringent fiber and the polarizer, pg 7, line 21-23 wherein the polarizer may be employed to align the polarization of the light output from the birefringent fiber, pg 8, lines 1-3. The signal that is passed through optical delay interferometer 24 is converted to an RZ signal, pg 8, lines 27-29. Since the polarizer follows the birefringent fiber in the optical delay interferometer, the output signal of the polarizer is an RZ signal, which is an intensity modulated signal and the polarized is a polarization sensitive device that is applied to the output of the birefringent fiber, which would output a polarization modulated signal)*.

To the extent that Stalford does not disclose a polarization-sensitive device configured to convert the polarization-modulated signal into a corresponding intensity-modulated signal, Cimini discloses a frequency shift key to amplitude shift keyed signal converter in Fig. 7 wherein a birefringent fiber B, Fig. 17 outputs two polarizations P_O and P_1, Fig 7. The output light of the birefringent fiber is then pass through a polarizer aligned with either P_0 or P_1, which blocks one polarization, in this case P_1, so that the output of the polarizer is an on-

off signal or a intensity modulated signal, Fig 7, lines 57-65. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that polarizer make the polarization modulated signal into amplitude or intensity modulated signal by removing the other polarization from the birefringent fiber.

10. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stalford et al (herein Stalford) WO 2004/023693), Han et al (herein Han) US PG PUB 2003/0090673, and Cimini et al (herein Cimini) US Patent 5,008,958.

Re claim 36, An optical signal receiver configured to detect a phase-modulated optical input signal, the optical signal receiver comprising:

a first optical signal modulation format conversion stage comprising a birefringent medium having first and second main axes of symmetry *(optical delay interferometer 24 is a birefringent fiber followed by a polarizer pg 7 ,lines 21-23, where the birefringent fiber includes two transmission axes, pg 7, lines 29-30)*, and a selected differential group delay between the first and second main axes of symmetry *(the two transmission aces, a "fast" axis and "slow" axes, wherein the difference in transmission speeds between the fast and slow aces operate to introduce a delay)*, and configured to separate a phase-modulated optical input signal passing through the first and second main axes into two optical components such that each optical component travels along different ones of the first and second main axes at a different group

velocity *(the birefringent fiber embodiment includes two transmission axes with different transmission speeds to introduce a delay, pg 7, lines 29-33 wherein the delay is imparted to the first portion of an optical signal with respect to a second portion of the optical signal pg 7, lines 22-25)* to obtain a polarization-modulated signal *(the polarization-modulated signal is a result of said birefringent medium. Since Stalford disclose such a birefringent medium, the results would be the same and a polarization modulated signal would be present)*; and

a second conversion stage comprising:

a polarization-sensitive device configured to convert the polarization-modulated signal into a corresponding intensity-modulated signal *(the optical delay interferometer, which includes the birefringent fiber and the polarizer, pg 7, line 21-23 wherein the polarizer may be employed to align the polarization of the light output from the birefringent fiber, pg 8, lines 1-3. The signal that is passed through optical delay interferometer 24 is converted to an RZ signal, pg 8, lines 27-29. Since the polarizer follows the birefringent fiber in the optical delay interferometer, the output signal of the polarizer is an RZ signal, which is an intensity modulated signal).*

Stalford discloses an optical polarizer within the optical delay interferometer, pg 7, lines 21-23. Stalford does not appear to explicitly disclose a photodetector for detecting the intensity-modulated signal. However, Han discloses a polarization mach-zehnder interferometer 100 which comprises a birefringent crystal 105 to polarize the light beam, if the light beam being inputted is unpolarizaed, ¶ [0018], a polarizer 112 set to polarize the light beam 114 output from the birefringent crystal 106, and a detector that 116 that detects the light passed through the polarizer, ¶ [0020]. Stalford and Han are analogous art because

they are from the same field of endeavor, birefringent interferometers. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Han and Stalford before him or her, to modify the optical delay interferometer of Stalford to include the photodetector after the polarizer of Han because it allows one to detect the light passed through the polarizer, ¶ [0020]. Naturally flowing from the combination of Stalford and Han, the detector would detect the intensity-modulated signal.

To the extent that Stalford does not disclose a polarization-sensitive device configured to convert the polarization-modulated signal into a corresponding intensity-modulated signal, Cimini discloses a frequency shift key to amplitude shift keyed signal converter in Fig. 7 wherein a birefringent fiber B, Fig. 17 outputs two polarizations P_O and P_1, Fig 7. The output light of the birefringent fiber is then pass through a polarizer aligned with either P_0 or P_1, which blocks one polarization, in this case P_1, so that the output of the polarizer is an on-off signal or a intensity modulated signal, Fig 7, lines 57-65. Stalford and Cimini are analogous art because they are from the same field of endeavor, format conversion. At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Cimini and Stalford before him or her, to understand that the birefringent fiber outputs a polarization-modulate signal and the polarizer make the polarization modulated signal into an amplitude or intensity modulated signal by removing the other polarization from the birefringent fiber.

Allowable Subject Matter

11. Claims 28, 30-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANYA NGO whose telephone number is (571) 270-7488. The examiner can normally be reached on M - F from 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngo/
May 5,2010

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613